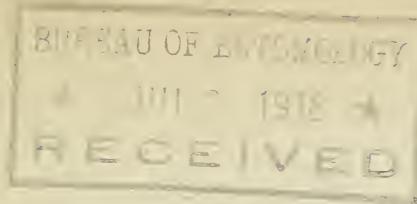


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EMERGENCY ENTOMOLOGICAL SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE.

Reporting cooperation between Federal, State and Station  
Entomologists and other Agencies.

Number 13

Washington, D.C.

July 1, 1918.

CONTENTS.

Reports of Sections of the Bureau of Entomology.

Reports from State Officers and other correspondents  
arranged by States.

FOREWORD.

As stated in the last number no notices will be sent out regarding this circular. All matter should be transmitted to Dr. L.O. Howard in time to reach the editor by the 25th of the month.

Enrollment of corresponding members of the class formed to study the Entomology of Disease, Hygiene and Sanitation has been very gratifying. Entomologists expecting to enter the army, especially in the Sanitary Corps will benefit themselves by enrolling.

W.D. Pierce.



REPORTS OF SECTIONS OF THE BUREAU OF ENTOMOLOGY.TROPICAL AND SUBTROPICAL FRUIT INSECT INVESTIGATIONS.

The discovery of a more widespread status of the banana root borer in Florida has led to a cooperative enterprise on the part of this Department with the Florida State Plant Board, and \$1,000 has been allotted for cooperative work in the extermination of this insect. Mr. Swartsel of Mr. Newell's force is in charge of this work.

A development of serious army worm damage to the castor bean crop in Florida has been under investigation during the month by Mr. Mozzette. This damage is so serious and the crop has such an important relation to war needs that it has been made a special project and will hereafter be under the direction of Doctor Hunter in its proper relation to the southern field crop insect investigations.

The known occurrence of the black fly in the ~~Panama~~ Zone and the possibility of this Zone being a point of introduction of other seribus pests has led to the establishment of a research station in the Zone. Mr. Harry F. Dietz has been transferred from the Federal Horticultural Board and has already left for Panama to take charge of this station. The black fly continues to spread in Cuba, and this menace to citrus and other cultures of Florida and the Gulf States is constantly increasing. Its investigation in Cuba and elsewhere will be continued during the summer by Mr. Morrison with the object of taking any additional measures which may be necessary to keep it from the United States.

In California there has been a serious outbreak of citrus thrips in Tulare and Los Angeles Counties, large shippers stating that the damage will go into millions of dollars. This outbreak is being specially investigated by Mr. Woglum for this Bureau in cooperation with State authorities.

C. L. Marlatt,  
June 27, 1918.

TRUCK CROP INSECT INVESTIGATIONS.

Angleworms have been the cause of considerable inquiry, especially in New York and Pennsylvania. These creatures are as a rule beneficial as is well known and the return of the robin and other birds which feed largely on angleworms helps to keep them in check; nevertheless they are troublesome on lawns.

Ants continue to be the cause of complaint, especially around New York City.

The melon aphis has been troublesome, especially in California, Oklahoma and Michigan.

The bean aphis (*Aphis rumicis* L.) continues injurious in California, and while rarer than usual in the District of Columbia, has been observed in considerable numbers on rhubarb.

Strawberry leaf-rollers of different species have caused injury in Maine and in Iowa.



The tenebrionid beetles, Coniontis subpubescens and Ulus crassus, have been reported injurious to beans and beets in southern California.

Cutworms were troublesome during the month in New York, New Jersey, Indiana, Wisconsin, Michigan, and Texas, and in several other States.

The potato tortoise beetle (Deloyala clavata) was reported injurious to potato in the District of Columbia.

Numerous complaints were made of the striped cucumber beetle.

The squash ladybird (Epilachna borealis) was quite troublesome in Virginia.

The potato flea-beetle (Epitrix cucumeris Harr.) continues to be the subject of complaint from Maine to New Jersey and Pennsylvania westward to California, to potato, tomato and even cucumber, the last record having been made by Mr. H. O. Marsh.

The tomato fruit worm (Chloridea obsoleta Fab.) has made a rather early start, having been reported during the first two weeks of June from Georgia, Alabama and southern California.

No very serious injury has been reported by the Colorado potato beetle in the north, in fact it has not made its appearance in the District of Columbia in injurious numbers, except in one section. It has been the cause of injury in Maine, New York, Pennsylvania, Connecticut, and the State of Washington.

The rose-chafer (Macrodactylus subspinosus) was troublesome on strawberry at Nashua, N.H. In earlier years it was injurious to rose bushes there.

The squash vine borer has been the subject of complaint from Massachusetts, Georgia and Kentucky.

The lima bean vine borer (Monoptilotis nubilella Hulst.) was injurious to stems of lima beans at Meridian, Miss., reported by Prof. R. W. Harned. What appeared to be the same larva was injurious to the pods.

The spinach aphis was reported injurious to potato radish, and turnip, from New York to Washington, D.C.

The common stalkborer (Papaipema nitela Guen.) has been unusually troublesome to tomato, potato, rhubarb, corn, red raspberry and pepper, from Maine to Maryland and Virginia and the District of Columbia, having been the subject of particular complaint in Pennsylvania. It was also observed in Illinois, Michigan and Texas.

Root maggots of different species were injurious to cauliflower in Massachusetts, cabbage in New York and Ohio, cauliflower in Pennsylvania, radish in Michigan, and radish and onion in Ohio, and in other regions; indeed they were the most troublesome species of the month.

The beet leafminer (Pegomya hyoscyami Panz.) caused trouble to spinach and beets in Massachusetts, New York and Indiana.

Cabbage worms have been as troublesome as usual.

Snails and slugs caused much damage in various regions.

The pale striped flea beetle (Systema blanda) was reported injurious to tomatoes and other truck crops in Wisconsin and Indiana.

The onion thrips has caused much damage from Wisconsin to Alabama and to Oregon, Washington and California, and probably in many other regions not reported.

Wireworms have been the cause of complaint in New York, Pennsylvania, Wisconsin, Texas and California, injuring potato, beans and other vegetables.

The potato aphis (Macrosiphum solanifolii Ashm.) was observed on



potatoes in the vicinity of Masonville, N.J., June 9, by D.E. Fink. This species has also been reported by the Kentucky Tobacco Product Co., as having made its appearance in Somerset County, Maryland, and in the Kaw Valley, Kansas. Last year this species was reported as far west as St. Louis, Mo. It would appear that it is spreading westward as a pest.

F.H. Chittenden,  
June 27, 1918.

#### Report of the Truck Crop Station, Wichita, Kansas.

The squash bug (Anasa tristis, DeG.) has become active, the rate of oviposition increasing with hot weather, but it is not numerous this year. The first nymphs are appearing in the field.

The strawberry leafroller (Ancylis comptana, Fröhl.) is present though not abundant. The reared adults of the first generation have deposited eggs which are now hatching.

The first summer generation of the Colorado potato beetle (Leptinotarsa decemlineata, Say) is maturing after a season of unusual injury, and the new adults are beginning oviposition; the species being found in all stages, though larvae are scarce.

Aphides are present but not abundant enough to do serious injury at any place visited. The principal species noted have been Aphis gossypii, Glover, and a green aphid on crucifers. Diabrotica virgata, Fab., and D. 12-punctata, Oliv., are present, and the former is doing some injury though not as much as in most years. Pontia rapae, L. has reached injurious numbers and is damaging cabbage. Autographa brassicae, Riley is unusually abundant and is injuring cabbage, lettuce, and peas.

F.M. Wadley,  
June 15, 1918.

#### Truck Crop Insects in New Jersey.

The potato flea beetle (Egirix cucumeris, Harr.) was observed injurious to potato, tomato and eggplant for the past several weeks in the vicinity of Riverton, Moorestown, Masonville, Mt. Holly, Bridgetown, Dividing Creek, N.J., and also in the vicinity of Fox Chase, Pa., where they were observed in great numbers on potatoes. At the latter place spraying was carried out with pyrex at the rate of 15 pounds to 50 gallons of water. Spraying was also employed in Riverton using Bordeaux mixture and lead arsenate, 2 lbs. to 50 gallons. Owing to the frequent rains the sprays produced only temporary relief.

June 5, potatoes were observed in the vicinity of Fox Chase, Pa. to have winged migrants of Myzus persicae, Sulz. These were in process of colonizing the plants and were just beginning to reproduce; also wingless forms of Macrosiphum solanifolii, Ashm. which evidently have been on the plants for some time. The forms observed were pink in color and were reproducing. It is fair to state at this time that both species will in the course of time, unless checked by parasites and predaceous insects, prove troublesome to the potato.



The Colorado potato beetle (Leptinotarsa decemlineata Say) has not been observed in large numbers in some localities, while in other places they were noticed doing considerable injury. Spraying is being employed in many instances and improved types of sprayers are used.

The seed corn maggot, Phorbia (Pegomya) fusciceps Zett. was determined as the species that was injurious to lima beans in the vicinity of Dividing Creek, N.J. It was also reared from onions from that locality and proved to be the principal species injuring onions. Other plants from which the species was reared were garden peas, potatoes, volunteer wheat, Valentine beans, and seedling onions. June 15, the third generation of adults were issuing in cage experiments.

About June 1, the second generation of the cabbage maggot, Phorbia (Pegomya) brassicae was observed in the vicinity of Dividing Creek and also at Riverton, N.J. The third generation of the onion maggot, Phorbia (Pegomya) cepetorum Meade was issuing June 15.

Individuals of the squash ladybird (Epilachna borealis) were observed June 12, in the vicinity of Riverton on cucumber and squash.

D.E.Fink,

June 15, 1918.

#### Report on Truck Crop Insects at Plymouth, Indiana, Station.

The main predator of the striped cucumber beetle in this vicinity is the ground beetle, Pterostichus lucublandus Say. These beetles have been observed feeding on the striped beetles several times this season. They hide at the base of cucumber plants and capture any adults of the cucumber beetle that happen to be in reach. Calosoma calidum Fab. has been seen around cucumber plants and is under suspicion. Females of Diabrotica vittata Fab. have laid over 200 eggs in a number of cases, the highest record to date being 292, with several eggs records in the 280's. Larvae were very common on wild cucumbers June 15. In a few days some of these should be pupating as they are rather large. Their damage to the wild cucumber roots seems to be from penetration and mining in the roots up to the first node where the damage terminates. A few adults of Diabrotica vittata Fab. have been captured on tanglefoot screens. The screen on the southwestern side of the field captured most specimens.

Judging from the number of flies that have emerged in the insectary, the next generation of the radish root flies (Pegomya sp.) must be emerging in the field. Flies reared from wild mustard appear to be the same species as those bred from radish. Several experiments for the control of the radish maggot have resulted in injury to the plants. Carbolic acid soap emulsion with the stock solution made up of 4 1/7 pound soap (laundry) to  $\frac{1}{2}$  gallon water and  $\frac{1}{2}$  gallon crude carbolic acid diluted to a strength of 1 part to 32 parts water showed very decided burning effect, completely killing the radishes which were in the second and third leaf stage. Common salt (NaCl) sprinkled heavily over the surface of the ground at the base of the radish plants showed a slight injury to the tips of the leaves.

Sodium arsenite, a stock solution at the rate of  $\frac{1}{4}$  ounce to 1 gallon of water and a pint of corn syrup to 4 gallons of the material very seriously injured the plants.



As the bean has rather tender foliage and is susceptible to arsenical injury the writers have been carrying on some experiments to determine the maximum amount of arsenate of lead they will stand without injurious effects. The spray is applied without the addition of lime. The first spray was  $\frac{1}{4}$  ounce of arsenate of lead to 100 gallons of water, in the second spray  $\frac{1}{2}$  ounce of poison was used. In both cases no injury was noticed.

A field of beets showed injury from the beet leafminer, Pegomya hyoscyami, Panz. Specimens are emerging in the insectary.

Flea beetles were noticed damaging cucumbers in a rather weedy field here, (Systema sp.) They were also noticed feeding on ragweed and purslane.

Adults of the horned squash bug (Anasa armigera, Say) are numerous and completely outnumber those of the common squash bug (A. tristis, DeGeer.). Last year the writers observed them on wild cucumber and this year were successfully reared on this plant in the insectary. We believe this species because of its fondness for cucumbers here is an important transmitter of wilt and mosaic diseases. Plans for demonstrating this are being considered.

M.R. Smith and J.W. Craig,  
June 15, 1918.

#### Flight of the Sweet potato Weevil in Mississippi.

You will perhaps be interested to note the following in regard to the flight of Cylas formicarius: One day while working in the laboratory at Ocean Springs, Miss., I noticed two of the weevils in flight. It was during the day, the time being about 3 p.m., hence it could not have been attraction to light. The departure from the crawling position was abrupt and the flight was strong and swift. After leaving the top of the table where they were crawling about, they circled around the room several times and finally came to rest on a breeding cage on the opposite side of the room.

While I do not believe that flight will ever be a factor in distribution that we will consider serious, yet I do believe that their power of flight has been underestimated. They are the most persistent crawlers that I have ever come in contact with.

K.L. Cockerham,  
June 14, 1918.

#### FOREST INSECT INVESTIGATIONS.

The elm leaf beetle (Galerucella luteola, Müll.) after a quiescence of a number of years is apparently on the increase again. In an effort to colonize the egg parasite (Tetrastichus xanthomelanae, Rond.) last year slight infestations only were found near Philadelphia and reported from Ithaca, N.Y. In Washington but one tree was found infested. This tree however was quite large and almost completely defoliated. Subsequently several small elm trees in back yards and on neglected city lots were



found fairly heavily infested. These same trees this year are again infested though none completely defoliated. Other trees, especially in back yards where they are beyond the reach or jurisdiction of the District shade-tree authorities, were found also quite heavily infested and two of them, large trees, were completely defoliated. Infestation was also observed on several street trees and one was reported to the office from 1922 3rd Street, N.W., which the city authorities were planning to spray about the 28th of the month.

Doctor Britton reports it on the increase along the Connecticut coast last year where many larvae were observed this year again.

Last year Mr. Yothers brought us specimens of the beetle for identification from Portland, Oregon, where he stated it was very bad on elms. So far as could be ascertained, this was the first record of its occurrence on the Pacific Coast.

Through Doctor Howard's efforts and the courtesy of Prof. Picard of the Ecole Nationale d'Agriculture, Montpellier, France, strong colonies of the egg parasite were received again this spring and advantage was taken of the trees under observation in Washington to attempt to establish it here. A more detailed account of this work will appear later from the pen of Doctor Howard.

For the following year it is desirable that entomologists in Galerucella territory keep this Bureau informed of badly infested trees, preferably in elm groves not subject to spraying. This knowledge will be necessary for distribution of the parasite next year either reared from those established here, if we are fortunate in accomplishing this, or for sending material that may be sent from abroad. As the parasite comes from southern France, southern locations in this country will be preferable as they will probably promise better chance for its establishment.

Jacob Kotinsky,  
June 27, 1918.

#### SOUTHERN FIELD CROP INSECT INVESTIGATIONS.

Mr. Mitchell reports under date of June 4 that Diacrisia virginica is exceedingly abundant at Victoria Texas. They are feeding everywhere. In a hundred yards along the roadside, he observed them feeding on seven different weeds. In many places doing serious damage to cotton.

Mr. Coad reports under date of June 22 a surprisingly heavy infestation of the boll weevil in Louisiana and Mississippi, the effect of the protection of timber being very noticeable. For example infestations at Lafayette, La., range from none to 55.8%, at Opelousas 28.4 to 48%, Washington 17.4 to 17.6%, New Iberia 14.3 to 18.4%, Jefferson Island 27.8 to 41.6% and Jeanerette 12.3 to 52.6%. The weevils were reported during the last week of May from Woodville and Lauderdale, Miss., and Almeli, Greensburg, Denham Springs, Plaquemine, Many, Arcadia, Natchitoches and Gonzales, La.



Mr. T.C. Barber reports that there is at present very little sugar cane injury in Louisiana and Texas. He noted however injury by the cane beetle Euetheola rugiceps (Ligyrus) at Lafayette, La.

W.D. Pierce,  
June 28, 1918.

#### OUTBREAK OF GRASSHOPPERS IN COTTON FIELDS NEAR DALLAS, TEXAS.

On June 8 representatives of the Trinity Farms Company called and stated that grasshoppers were causing serious injury to cotton on their farm in the Trinity bottoms between the Elm Fork and West Fork of the river. On June 11 the fields were visited. This company has about 3500 acres in cotton and possibly one-fourth of this acreage in corn, sorghum and other crops. The grasshopper injury was found to be confined largely to land rather close to the West Fork of the Trinity which was cleared last fall and plowed during the spring. The cotton was rather late and hence small for this time of year. In certain places it was found the grasshoppers had completely stripped the plants and some of them had been eaten so that the terminal buds were destroyed. In most cases, however, the injury was to the larger foliage and will not seriously affect the future growth of the plants if the injury was not allowed to go further.

Practically all of the grasshoppers seen were nymphs, apparently Melanoplus differentialis. A few Dissosteira carolina adults were seen in the fields and a few of a smaller species of Melanoplus. There appeared to be no marked migration from uncultivated areas, but that the hoppers had bred out around the stumps and from other parts of the field which had not been thoroughly broken in plowing. A considerable amount of sprouts had come up from the old stumps and these were being fed upon extensively by the hoppers, especially in the case of the hackberry.

It was advised that poison bran mash be applied and the sprouts be left growing so as to keep the hoppers away from the cotton until the poison had had its effect.

The mash was mixed up approximately according to the following formula: 100 lbs. "Victory" bran, 5 lbs., Paris green,  $2\frac{1}{2}$  gals syrup, 3 doz. lemons, and 15 gallons water. Part of the poison was made up without accurately weighing the ingredients, although this was advised against. The application was begun June 10 and continued until June 14. Wheat bran is not available and hence "victory" bran composed of the following ingredients was used: 60% hominy feed (corn), 10% cotton seed meal, 30% rice hulls. About 500 acres of cotton was poisoned, something over a ton of bran being used.

On June 14 the field was visited and it was observed that the distribution had not been very thorough, a good many large lumps of the material being found. Where the distribution was proper it appeared that about 75% of the hoppers had been killed. An examination of the ground in the portion of the field where weeds were not numerous showed that there were about three dead hoppers per square yard of surface. The number of dead and living in these portions of the field where many sprouts and weeds existed, Certainly some of the poison applied on the previous day would still be effective in killing some hoppers. Apparently the injury to the cotton



has been greatly checked by the application of the poison, but it may be necessary to make another application, especially if all of the weeds are killed so as to allow the hoppers to concentrate on the cotton plants.

NOTES ON THE ABUNDANCE AND INJURY TO CORN, AND POSSIBLY LATER INJURY TO COTTON BY THE COTTON BOLLWORM.

Complaints have been received from parts of Dallas County during the first half of June of considerable injury to the growing tips and tassels of corn from some worm. Investigation made by the writer and Mr. F. W. Humphrey on June 17 showed that the insect concerned was the common bollworm, *Heliothis obsoleta*. About thirty to fifty per cent of the corn stalks showed injury had been inflicted in the growing tassel and tip, but the corn had for the most part outgrown this damage. Bollworms were very numerous in the corn ears however. In several fields examined 100% of the ears which had had the silks out for several days were infested. Bollworm moths were found to be very common in the axils of the leaves and growing tips of the corn plants and great numbers of them were present in the weed growth along the margins of the fields.

*Triphleps*, *Chrysopa* and lady beetles were fairly abundant and will undoubtedly help in keeping the pest in control. It would appear, however, that the abundance of this pest is considerably above normal and unless natural control agencies become strongly operative we may look for serious injury to cotton later in the season. The cotton crop is generally late through north Texas, and this will also operate to the advantage of the bollworms.

F.C. Bishopp,  
June 20, 1918.

CEREAL AND FORAGE INSECT INVESTIGATIONS.

Although the Hessian fly infestation continues to be inconsiderable in the Mississippi basin, it is present in large numbers locally east of the Appalachian Mountains. Particularly is this true of the more southerly states where winter wheat is grown. Reports and specimens have reached this office from South Carolina and Virginia which indicate a considerable degree of infestation. The return of better wheat growing conditions, indicated by the greatly improved outlook for winter wheat will doubtless signal the return of the Hessian fly in injurious numbers.

Comparatively little chinch bug injury has occurred during the present summer except locally. One such infestation is in progress at Lawton, Oklahoma, where the destruction of the experimental cereal plots of the Bureau of Plant Industry seemed inevitable. It is believed at the present time that this outbreak is under control. Mr. A. F. Satterthwait is conducting the control work.

Present indications point to severe injury by grasshoppers in Montana, North and South Dakota, Washington and Oregon, and probably California and Colorado. Arrangements have been completed to have shipped into the Dakotas several thousand pounds of white arsenic for use in the grasshopper work. G. N. Ainslie, under date of June 6, reports grasshopper eggs in South Dakota,



and that the eggs are hatching freely. Mr. Urbahns reports general crop conditions not up to normal throughout California, and grasshoppers becoming numerous because of the dry spring. He is preparing to conduct a campaign against the insects. A similar report comes from Mr. Creel with regard to Oregon where dry weather has prevailed for several months.

Mr. V. L. Wildermuth, under date of June 10, reports from Las Vegas, N.M. that the region throughout northeastern New Mexico, formerly infested with the range caterpillar, is apparently nearly free from this pest. Severe drouth has existed throughout the region for two summers. The introduction of natural enemies has resulted in the effective control of the pest.

The cooperative investigation of the European corn stalk borer being carried on by the Bureau of Entomology and the Massachusetts Agricultural College in eastern Massachusetts is being pushed with vigor. D. J. Caffrey, R. H. Van Zwaluwenberg, and F. H. Gates are now representing the Bureau of Entomology in the work, and Mr. Stuart Vinal is carrying on the activities for the Agricultural College. The services of Mr. John Moore have also been secured for the cooperative control work. An infestation of the insect was reported from Putnam, Connecticut, but upon careful investigation this was found to be an erroneous report, the injury having been caused by a common stalk borer (*Papaipema*). It has been found that the earlier work of the first generation this year is more common in the stems of widely distributed weeds than in the corn itself. The work of the first generation on corn has been observed within the past few days. The insect has not been found outside of the area which was indicated as being infested by the surveys of the fall and winter, excepting in the town of Danners some ten miles north of the northern limit of infestation. It is expected that when the caterpillars become larger and their work more obvious, the reports of infestation may be received from almost anywhere in eastern New England.

Mr. H. B. Parks State Extension Entomologist for Texas, reports an interesting outbreak of the salt marsh caterpillar in fields bordering the Red River during the early part of May. They hatched in a large sage brush pasture and injured corn severely. The caterpillars seem to prefer corn to sorghum. A campaign was organized by the local authorities and the infestation is now reported as having subsided.

Mr. A. H. Hallinger reports that the rough-headed corn stalk borer was found to be numerous and injurious to corn, rice, and cane in the vicinity of Orange, Texas, and in the southern portion of Tyler county. He reports that the chinch bug situation is well in hand and it is not believed that serious general injury will occur.

Joint worms are numerous in wheat causing considerable loss according to reports received from Indiana, Illinois, Virginia, and other southern states. Prof. R. H. Pettit of Michigan reports general and severe injury to wheat throughout his state by jointworms, and is considering the advisability of recommending the sowing of rye instead of wheat in order to prevent greater losses to the crop of 1919. Mr. George Ainslie also reports considerable injury by jointworms throughout Tennessee.

No unusual injury from the southern corn root worm has been reported during the present season except locally.



Notes from the Lafayette, Indiana Station.

As anticipated, cutworms have been destructive to corn in Iowa, Wisconsin, and Michigan.

From the abundance of grasshopper eggs found by Mr. Ricker this spring in Wisconsin, and the numbers of young hoppers now to be found almost everywhere, we anticipate considerable trouble later in the season.

We find white grubs less abundant than three years ago but they occur in injurious numbers in many sections of the infested area. In some localities the grubs are apparently as numerous, while in others they are undoubtedly less abundant, than in the fall of 1917. This may be due to several reasons: A year ago the beetles did not appear until late, resulting in a large number of very small and immature grubs to pass the winter and these grubs with less vitality and strength no doubt succumbed to disease and the cold more easily than in a normal season and especially is it probable that the sudden freeze last October (which occurred before the grubs had reached their deep winter quarters) was detrimental to white grubs. It is not likely that the cold weather during the past winter would have been any more destructive to grubs than in normal years had it not been for the contributing factors mentioned above. The less general abundance of grubs this year in comparison to three years ago is partly due to the fact that the May beetles did not appear until late last season and the continued cool weather prevented them from ovipositing freely. Similarly it appears that the cool weather prevented the beetles from migrating such great distances from their host trees as in former years. The majority of grubs did not come near to the surface until the middle of May because the soil was cold up to that time and as a result, farmers did not notice grubs and many planted corn on sod ground believing they were not present, when as a matter of fact the grubs were below the plow line when the ground was plowed. This doubtless resulted in many injured fields of corn and it is important that we be prepared to recommend crops which can be planted after the first of July. Information regarding such crops has been procured from Experiment Station agronomists in the states involved and it is interesting to note that all recommend among other crops, buckwheat and millet. Millet is good where hay or seed is desired while buckwheat is now a profitable crop because of the high market price and its utilization as a wheat substitute.

The effect of the cold winter was illustrated in an interesting way in the case of the joint worm. At Shelbyville, Indiana, practically the center of the 1917 joint worm area in Indiana, we found practically all larvae killed in the upstanding stubble, but in the stubble lying in or near the ground and most of that lightly covered with soil as a result of fall plowing, many live larvae were found here; there appeared to be only the usual mortality. Stubble lying on the ground was protected by snow during the period of coldest weather.

Jointworm adults began to issue in central Indiana about May 10. Mr. Hollister visited Shelbyville, Indiana, May 20, and found adults abundant and ovipositing in wheat. They have continued common in that vicinity until recently. The injury to wheat is just becoming apparent and indications point to a rather heavy infestation but appreciably less than a year ago.

Recent reports from Mr. Turner continue to indicate a scarcity of Hessian fly throughout southern Illinois.

Webworms have destroyed corn in sections of northern Indiana. The



wheat sawfly was also present in unusual numbers on oats in northern Indiana but no important damage was noted.

Mr. Hollister observed a unique injury to oats near Holland, Michigan. The injury was caused by a tiny dipterous larva, apparently not Oscinus, which burrowed in the oats stem, killing the central shoot, eventually resulting in the death of the plant.

An unusual occurrence of root aphid (*Geoica squamosa*) on corn was reported by Mr. Picker from Janesville, Wisconsin, and Professor Troop has submitted specimens from Tipton, Indiana, which prove to be the same species which he reports as destroying a field of barley.

The corn seed maggot was responsible for considerable injury, especially in central Indiana, but in all cases observed it was traceable to the usual causes, namely, weak and slow germinating seed or late spring application of manure.

J. J. Davis.

Notes from the Forest Grove, Oregon, Station.

Clover flower midge infestation is general throughout the Pacific Northwest. The first generation of adults commenced to appear about the 5th of May and are still emerging in increasing numbers. Adults so far have not emerged in as large numbers as they had up to this date a year. Due to the extension campaign now being carried on by members of the Forest Grove Station staff, in cooperation with the extension department and county agents of Oregon and Washington, it is believed that early cutting of the red clover hay crop will be largely resorted to by the clover seed growers as a means of midge control this season.

Clover root borer infestation is less severe this spring than at any time noted during the past three seasons.

The Hessian fly is infesting spring and fall wheat fields in all parts of the Willamette Valley, Oregon, and as far north as Lewis county in Washington. All observations lead us to believe that the fly is more abundant this season than last. Infestation is particularly severe in fields which were in wheat last year and re-seeded to wheat this spring - also in fields bordering red clover fields where the wheat stubble is still standing. In such fields from 25% to 50% infestation has been observed, in both fall and spring wheat. Adult flies commenced to emerge April 4 and practically all were emerged by May 4. The main portion of the brood is now in the advanced larval or flaxseed stage.

*Macrosiphum pisi* is doing an enormous amount of damage to the vetch crop in various portions of the Willamette Valley. Due to the cool cloudy weather of the past two weeks, the development of all natural enemies has been very slow.

*Aphis avenae* is present in large numbers on oats in many parts of the Willamette Valley, and ruining the crop in some fields.

*Macrosiphum granarium* on wheat is also very abundant and undoubtedly doing fully as much, if not more damage than Hessian fly at the present time in the Willamette.

*Macrosiphum creelii* has caused serious injury to the alfalfa crop in Walla Walla County, Washington, during the past month. The latest observations indicated that the natural enemies were gaining control in eastern



portions of the county but had not yet done so in the vicinity of the city of Walla Walla. Infestation by this insect is not general, as it was difficult to find in the alfalfa fields of the Yakima Valley, less than one hundred miles away. An outbreak of this aphis at Fernley, Nevada, was reported to the writer by telegraph by Professor S.B. Doten last year.

No reports of serious grasshopper outbreaks have reached this station except from Central Oregon. Special Field Agent B.G. Thompson has been carrying on an extensive poisoning campaign in the vicinity of Burns during the past month, and reports that the grasshoppers have been hatching out in immense numbers in many localities.

The outbreak of the Coulee cricket is severe in northern Grant county, Washington. Special Field Agents, Burrill and Reeher have been on the ground for some time past assisting farmers in carrying out various control measures. The extension entomologists report that the poisoning campaign has so far not been a success and that fencing has had to be relied upon to keep crickets out of the wheat fields. Efforts are also being made to destroy the various cricket armies by trapping and burning before the oviposition period commences. Coulee cricket control work in Grant County, Washington, has met with signal success this year. The poisoning experiments were not generally successful. Trapping and burning have proven to be the methods of greatest utility. Success was attained in keeping the insects from the wheat land and preventing them from invading other cultivated fields. Seventy-five to ninety per cent of the insects were destroyed over considerable areas. Greater success was secured by herding the invading armies of Coulee crickets into the smallest possible area and destroying them by means of gasoline torches. Fences were moved further toward the breeding grounds and the process repeated.

Under date of June 17 Mr. Burrill reports that the local outbreak of Macrosiphum creelii mentioned by Mr. Creel appears to have been entirely cleaned up by natural enemies.

C.W. Creel.

#### Reports of Insect Injury from the Columbia, S.C. Laboratory.

The damage from the southern corn root worm during the present season seems to be very light, which is especially remarkable considering that theoretically it is an exceptionally favorable year for the insect, as it prefers the cold moist weather which has prevailed especially in the northern portion of its range. Possibly the abnormally cold winter is responsible for the light injury from this pest. During April, flea beetles did considerable damage to young corn throughout Florida, Georgia and South Carolina. The corn ear worm is becoming apparent from its work on the buds of young corn plants south of Columbia and at Atlanta. Damage from corn bill bugs has been reported from Willard, N.C. Other insects encountered are Prodenia ornithogalli on the younger corn, and the larger corn stalk borer.

Philip Luginbill.



## DECIDUOUS FRUIT INSECT INVESTIGATIONS.

From French Creek, W.Va., Mr. F. E. Brooks writes that the average temperature has probably been somewhat higher than normal and insects of all kinds have been active, although there has been a marked abundance of only a few injurious species. Rose bugs, Macrodactylus subspinosus, have been abundant and destructive. Among the fruits early apples, grapes, cherries and plum foliage have suffered most. In addition to the plants usually attacked by this species, injury has been observed this year to ripe black-cap raspberries, service berries, the foliage of Japanese honeysuckle, the flowers of Lilium candidum and Japanese iris. At the present date the beetles are dying off and those that are still alive are forsaking all other plants for the male catkins of chestnut. In this locality the blooming of chestnut trees usually marks the end of injury to other plants by this species as the beetles seem to prefer the catkins to any other food. There is need of some more effective method of dealing with this insect.

Injury by both the codling moth and plum curculio is somewhat below the normal. There is an entire absence here of tent caterpillars, Malacosoma americana, not one tent having been seen this season. He thinks this condition has not occurred in central West Virginia before in twenty years. The first brood tents of the fall webworm, Hyphantria cunea, are also unusually scarce, although a few have been observed. The apple curculio, Anthronomus quadrigibbus, is unusually abundant on wild crab apple, but has not injured cultivated apples seriously. Serious injury to the young nuts of black walnut by the walnut curculio, Conotrachelus juglandis, is occurring at the present time and young hickory nuts of several species are beginning to drop as a result of infestation by the larvae of Conotrachelus affinis. Grape curculio beetles, Craonius inaequalis, are beginning to oviposit in young grapes in numbers indicating the usual serious injury in this locality.

In Michigan, according to Mr. F. L. Simanton, insect conditions in orchards continue favorable. The plum curculio while rather less abundant than usual is concentrated on the fruiting trees and its work is much in evidence. Rose chafers and the tussock are rather more common than usual, but are not doing special damage.

Writing from Indiana, Mr. R. W. Kelley, engaged in extension entomology, reports that insect conditions in that state are about normal, with the plum curculio easily the worst enemy, its injury being much in evidence throughout the entire state. On the whole, insect conditions are considered quite favorable.

In the Cleveland section of northern Ohio, Mr. H. G. Ingerson advises that in old apple orchards where sod mulch system of culture is followed, the curculio has not been generally controlled even with thorough spraying. The white Enomid, Ennomos subsignarius, has been reported as locally destructive at Royalton, Ohio, in apple orchards and in forest growth. Grape berry moth larvae which are now appearing are present in smaller numbers than during the past three seasons.

In the Sandusky region, as reported by Mr. G. A. Runner, the heaviest emergence of the over-wintering material of the grape berry moth occurred between June 1 and June 12, the peak of the emergence coming on June 3. The evidence indicates a somewhat lighter infestation of the insect than during 1917. Blossom buds of grapes infested by the grape blossom midge,



Contarinia johnsoni, has been found in vineyards in the Venice and Island belt, though injury thus far has not been serious.

Mr. S.W.Frost furnishes the following information concerning insect conditions in Adams County, Pennsylvania.

During the early part of the season Lygidea mendax and Conotrachelus nenuphar. Herbst caused considerable injury to the fruit. The plant lice on apple has has been recorded from other parts of the country, have been few in number. Aphis avenae was first very abundant but soon disappeared. A. sorbi and A. pomi were at first very scarce. About the middle of May A. sorbi became more evident, but even then was scarce. Now, due to parasitic and predaceous enemies, A. sorbi has practically disappeared from the trees. At the laboratory, however, A. sorbi is still on the apple; some of the winged forms have migrated to the plantain. A. pomi is becoming quite common now.

The apple leaf crumpler, Mineola indigenella Zeller is quite abundant in some orchards here. The adults from the overwintering larvae have issued and are now abundant in the field.

In the various orchards in the vicinity, Empoasca mali is abundant and causing serious damage to young trees. The leaves have been badly curled and are turning brown.

In the Arkansas Valley, according to Mr.W.R.Martin, the codling moth is causing considerable damage. Some orchards show a loss at the present time of 30% and the second brood has not made its appearance. Ordinary spraying does not seem to control the insect, since some of the orchards showing most injury have been sprayed almost continuously since the falling of the petals. Injury to young orchards has been noticed by the imbricated snout beetle, Epicaerus imbricatus. Arsenate of lead was found effective wherever spraying was done in time. The first brood of the apple leaf skeletonizer appeared early in June, though no serious damage has yet been noticed.

Messrs. Dwight Isely and A.J.Ackerman report from the Bentonville, Ark., region that side injury from the codling moth became apparent in a number of orchards during the last of May and earlier part of June. The development of the first brood was very rapid due apparently to unusually high temperature, and early individuals of the second brood are now hatching. Certain other apple insects are particularly in evidence, as apple leaf-hoppers, of which there are at least three species present in orchards; the imbricated snout beetle, quite generally distributed, but injurious only locally; and the apple leaf skeletonizer, Canarsia hammondi, which is just beginning to appear. Insect pests of the grape are much more in evidence than those on apple, and the following have been noted in injurious numbers: grape root worm, Fidia viticida; grape curculio, Craponius inaequalis; grapeberry moth, Polychrosis viteana; and Colaspis brunea.

In Texas, Mr.C.J.Foster advises that he finds the curculio doing unusually small damage to fruits this year. The San Jose scale has almost disappeared in comparison with its abundance during 1916. Fruit-tree barkbeetles however are very prevalent, and the tent caterpillar and twig girdler are doing considerable damage.

Mr. John B.Gill, writing from Monticello, Florida states concerning pecan insects that according to his information the pecan crop in Texas will be greatly reduced on account of attack of the green nuts by two species of Acrobasis larvae; one species has been definitely determined as



Acrobasis hebescella, and the other one involved is doubtless Acrobasis caryaevorella. These reports have come from Mr. J. D. Mitchell of Victoria, Texas, and Mr. A. L. Fabis of Brownwood Texas. Both of these gentlemen also report that caterpillars of Datana integerrima are beginning to appear in numbers on pecan trees.

In Mississippi, Mr. Oliver I. Snapp, advises that Datana integerrima larvae are considerably in evidence on pecan in the coast district of that State. Lachnostenra beetles have also done considerable injury to pecan trees, especially young ones from Jackson south to the coast, and noted to be especially injurious in Hinds, George, Pearl River and Coast Counties. In unsprayed apple orchards the codling moth injury has been noted to be from 75% to 80% of the crop. Injury was especially in evidence in Lee County. While curculio injury is general all over the state, a good crop of peaches is expected in the more northern counties. Twig borers (probably Laspevresia pyricolana) are very numerous in apple nursery stock in northern Mississippi.

In Alabama, Dr. F. L. Thomas reports that the greatest troubles in that state seem to be the San Jose scale, peach tree borer, fire blight, codling moth and plum curculio. There is also a general lack of knowledge among smaller fruit growers of spraying.

In Washington State, according to Mr. R. M. Fulton, there has been a great deal of aphis injury in apple orchards, particularly by the rosy aphis, in some cases the injury running as high as 25 or 30%, but this is higher than the average. The woolly aphis is particularly bad in the Kennewick and Sunnyside sections, and in extreme cases it is difficult to find fruits that do not have the calyx cups filled with the insect. Some few growers are making a determined fight against the aphis and are controlling it in a satisfactory manner. Codling moth larvae are beginning their work, and from the condition of orchards seen around Yakima and Sunnyside it appears that they have gotten a good start.

Mr. E. J. Newcomer, writing from Portland, Oregon, states that the weather has been very dry and there has been practically no rain either in May or June, although the normal precipitation at Portland is about two inches for each of these months. This has made the damage done by aphids to cereal and garden crops particularly severe. On fruit trees, an aphis, probably Phorodon humuli, has been more abundant on the prunes than ever before and has done some damage. Damage by aphids is reported to be quite severe in the Wenatchee Valley, some growers being quite alarmed at the amount of fruit deformed by the rosy apple aphis. It was estimated that in some cases this amounted to 25 or 30%. About Portland, the ladybirds and Syrphus flies are becoming very abundant, and will undoubtedly do a great deal towards reducing the number of aphids.

The pear slug is very common in this region this season and promises to do considerable damage if no remedial measures are applied. There was no difficulty experienced in finding pear leaves which had had from nine to 30 eggs deposited on them, and had from six to twenty-five slugs feeding on them at the time examination was made. An examination of several orchards near Vancouver, Washington, showed the same thing. As nearly as can be told at the present time the codling moth is being satisfactorily controlled where spraying has been properly done. In other orchards there has been no difficulty in finding worms.



Mr. H. K. Plank, engaged in cranberry insect investigations in Washington State, states: "Subsequent to the finding of considerable injury to the roots of cranberry vines covering about one-half an acre of a large bog near Cranberry Station, Washington, numerous larvae of what appears to be Rhabdopterus picipes Oliv., were discovered at work May 29. The vines were rather thick and injury has been noticed to increase every year for the past two years. The necessary steps for control are being taken, and no difficulty is anticipated in combating this pest. Thus far no adults have been seen, but a pupa was found under these vines on June 18.

Since June 7, adults of what Mr. Plank has determined as Crambus hortuellus Hüb., have been observed and collected on many widely scattered cranberry bogs and grass lands over the Peninsula. Thus far only one case of severe injury by this pest has been observed, and this covers about 5 or 10 acres of a bog about 30 years old which has been neglected for a long time. No effort by the owner is being made to control this pest, but it is expected that steps will be taken soon in this direction. The blackhead fireworm situation remains about the same as reported last month, and the growers generally are beginning now to see the effects of spraying with nicotine sulphate 1-800 and soap 2-50. Pupae of the first brood have been observed since May 24 and adults since June 6. Both are now to be found in large numbers on particularly the unsprayed or carelessly sprayed bogs, the pupae mostly in loosely-spun cocoons in trash beneath the vines. Eggs are now being deposited in fairly large numbers, and on neglected bogs a rather severe infestation by the second brood is looked for. A few small larvae have been noticed entering the blossoms before they have opened at a point near the base of the petal. Once inside the blossom, they begin eating the floral organs and then the ovary, which is hollowed out and later on has the appearance of being blasted. An application of nicotine sulphate 1-600 with soap 2-50 June 5 was very effective in killing the larvae in this condition. A four acre patch of wild cranberry vines between Oysterville and Nahcotta, Wash., was found on June 21 to be very badly infested with what appears to be Rhopobota vacciniana Pack. It is interesting to note in this case that the nearest cultivated cranberry bog is over two miles to the north of this point with forest and swamp land intervening.

A large number of small moths similar to those of Rhopobota vacciniana Pack. in size and habits, but differing very much in markings, has been collected from one marsh near Seaview, Wash., which is also badly infested with the latter insect. Specimens have been submitted for determination. No appreciable damage has been noticed and the area covered is very small; so unless it should be discovered in many other places, very little trouble is looked for from this pest.

A. L. Quaintance,  
July 1, 1918.



REPORTS FROM STATE OFFICERS AND OTHER CORRESPONDENTS  
ARRANGED BY STATES.

ARIZONA.

The cotton aphis, (*Aphis gossypii*) was very abundant on cotton during the early part of the season but was effectively controlled by hymenopterous parasites before any serious damage was done. The cotton thrips (*Thrips* n.sp. Morgan) has done noticeable injury in at least two sections stunting the growth of young cotton plants but not completely destroying them. In one instance the red spider (*Tetranychus bimaculatus*) has been found in great abundance on dewberries and beans growing in a field adjoining a field of Egyptian cotton while in the cotton field the red spider was found only on a weed. This pest has been looked upon with apprehension but in no instance so far has it been found upon cotton in this state. Observations will be made to show whether or not Egyptian cotton is immune in any degree to attack by the red spider or whether its freedom from attack in Arizona so far is to be attributed to other conditions. Grasshoppers are beginning to do considerable damage in alfalfa and cotton fields. Between one and five percent of the specimens of the differential grasshopper have reached the adult stage. The shortage of wheat bran makes it necessary to use substitutes in grasshopper baits. At present a half and half bran sawdust mixture is principally used but other materials such as maize bran or barley middlings will have to be used in place of the wheat bran in the near future. The value of these materials as substitutes has not yet been determined.

A.W.Morrill,  
June 18, 1918.

CONNECTICUT.

The season, though earlier than usual, has thus far been cold and wet here. The potato or cucumber flea beetle, *Epitrix cucumeris* Harris, has been unusually abundant and has seriously injured potato, tomato, cucumber, Chinese cabbage, and many other crops. The three-lined potato beetle, *Lema trilineata* Oliv., is more prevalent than I have ever seen it in Connecticut. Adults have devoured some of the leaves and the larvae are now feeding. The Colorado potato beetle, *Leptinotarsa decemlineata* Say is normally common.

The potato aphis, *Macrosiphum solanifolii* Ashmead, has appeared in many fields in New Haven and Fairfield Counties, but in only one instance have the colonies seemed to be increasing rapidly. The conditions are being watched and if the crop is threatened, the owners will be advised and urged to spray with nicotine solution.

The bean leaf beetle, *Cerotoma trifurcata* Forst. is not usually looked upon as a pest in Connecticut, but this season the adults have been observed in several gardens perforating the leaves of beans.

The striped cucumber beetle, *Diabrotica vittata* Fab. is apparently somewhat less injurious than last year though it has done considerable



damage. The beet and spinach leaf miner, Pegomyia vicina Lint., has been troublesome; in one garden about every leaf on several rows of beets contained one or more mines.

The first rose chafer was observed June 2. Usually June 11 or 12 is when the adults appear. June 9 is the earliest prior record of observations extending over several years.

Young San Jose scales were observed for the first time this season on June 19, which is fully a week earlier than usual.

Larvae of the raspberry sawfly, Monophadnoides rubi Harr. riddled a one acre field of red raspberries near New Haven in May.

W.E.Britten,  
June 25, 1918.

#### KANSAS.

In the western third of the State there is a general outbreak of grasshoppers. Through the extension entomologists the farmers were kept in close touch with the situation and in nearly all districts they organized for cooperative control work. Excellent results are now being had with the poisoned bran mash flavored with fruit juice and already thousands of acres of alfalfa, oats, and sugar beets have been protected. In southwestern Kansas, the extension entomologists report that in some fields the dead grasshoppers are so thick that the stench is very bad. In some catfields where the grasshoppers have come in from surrounding pastures and meadows, they are so abundant as to actually give the field a reddish tint, especially in the evening when they crawl up the stalks to roost.

Geo.A.Dean,  
June 20, 1918.

#### LOUISIANA.

The month has been characterized by high ranges of temperature, accompanied at times by heavy precipitation. Both seem to have been favorable toward an increase in insect life in this section.

Among the more prominent destructive insects, the Colorado potato beetle, (Leptinotarsa decemlineata) has been quite prominent, materially injuring eggplants, in a few instances the tomato crop, while such potatoes as still had foliage have been cleaned up by the insect.

The fall webworm (Hyphantria cunea or textella) has been much in evidence in the public streets. This is the second brood of larvae. The Parking Commission here has gone to work systematically to clean out the webs by torch and spray, and in minor infestations cutting out the colony and burning the same. There is some apathy on the part of the householder but with the outskirts of the city showing the webs in abundance, the July crop of moths may possibly arouse interest.

General complaint is heard on all sides of the abundance of mosquitoes, and it is a question whether or not the crop is larger than in any year since



the drive on Aedes calopus, during the yellow fever visitation in 1905. The old "gag" of the swamp mosquito (Aedes sollicitans et al.) being blown in does not go for the principal culprit is the ordinary Culex 5-maculatus.

The larger cabba leaf roller (Calpodes ethlius) has been very numerous and has done considerably damage to the lilies, and in some instances has attacked the ornamental Caladiums. Contrary to previous experience the larvae has been more plentiful on the yellow varieties than on the more tender leaved bronzes.

The cornear worm (Heliothis obsoleta) has been very conspicuous of late in the ears brought into the public markets here. It is almost safe to estimate that fully twenty per cent of the sweet corn seeking the public markets shows signs of the larvae.

The so called "woolly bears" are at present very numerous and are causing considerable damage to young chrysanthemums. Three species of the Arctiidae seem to be represented, Estigmene acraea, Isia isabella, and Diacrisia sp. Hand picking has been universal but the writer has noticed that where weeds and grasses have been kept down in the vicinity of the beds, there has been comparatively little damage. On three occasions the writer has been consulted recently in regard to damage by the lace-wing bug (Corythucha sp.) to Chrysanthemums.

Outside of the above species the month has developed as far as the writers observations go little in the way of conspicuous damage.

Ed. Foster,  
June 26, 1918.

#### MASSACHUSETTS.

During the early part of May many complaints of the work of the bud moth were received, but otherwise little of interest developed until June.

The plum curculio has caused considerable injury in all of the fruit growing regions of the state, and the red bug has been particularly abundant and caused much loss in several counties. The tent caterpillar is exceedingly scarce this year except on Cape Cod, and the San Jose scale promises to be less serious than usual, this being perhaps due at least to some extent to the severe winter. The green apple aphid is very abundant in some regions, but not generally so.

At the present time the Rose Chafer is doing considerable injury in the southeastern part of the state and in more sandy regions elsewhere. Complaints of its presence have referred particularly to the grape. The Grape Plume Moth has also been abundant. The currants have been attacked more than usual this year by the four-lined leaf bug.

The increase of interest in gardering in this state has led to many inquiries about garden pests. Flea beetles have been unusually abundant and have caused much damage to tomatoes, potatoes, and in some cases beans. The Cucumber Beetle has also been a serious pest. Cutworms though abundant locally have not been plentiful in general, but leaf miners on beet, spinach and chard have been the cause of many inquiries. The



Gypsy Moth has attacked garden crops to quite a serious extent in many parts of southeastern Massachusetts, and spraying for this pest appears to have only recently been begun in that region, according to the reports received.

The season in Massachusetts during May was on the whole affoward one, there having been considerable warm weather during the latter part of that month. June, however, thus far has been rather cold and in some elevated regions of the state there was a frost on the night of June 19, which in some places caused considerable damage. Fruit has set well, and with the exception of peaches of which there will be none, there is every indication that the crops will be of at least average size.

H.T. Feñald,  
June 21, 1918.

#### MONTANA.

Grasshoppers have appeared in very destructive numbers in several counties in Montana and we are receiving many calls for help. A number of grain fields have been completely or partly eaten off already by the very young grasshoppers. The feature of the season seems to be the great numbers of young grasshoppers which are able to eat off fields while we are as yet unable to poison them, probably because of their small size. From present indications we are expecting more or less serious grasshopper troubles from something like a dozen counties.

Adult potato beetles have appeared in unprecedeted numbers in various parts of Montana and have in many instances completely eaten off the tops of the vines. Montana farmers have not been in the habit of poisoning for the adult beetles but have resorted to this treatment very generally this season and in small gardens in town owners have been handpicking the beetles. No shortage of arsenicals is apparent. We have been able to arrange with the Anaconda Copper Mining Company for any amount of the white arsenic for poisoning grasshoppers, and Paris green, arsenite of zinc and arsenate of lead are in stock in various parts of the state. The prices of these arsenicals are very high, higher than they should be, and the retailers are demanding what we believe to be exorbitant prices, considering what they have to pay.

Another feature of the season so far has been the unusual prevalence of cutworms in gardens, potato fields, and grain fields. The species concerned has not as yet been determined but it clearly is not the army cutworm which in 1915 ate off about 100,000 acres of fall grain in Montana.

A dipterous maggot, apparently one of the Anthomyidae, has appeared in several counties in the state, destroying young grain plants, patches in fields appearing and increasing in size as the maggots feed. The maggot bores into the stem below the surface of the ground and destroys the central growing portion, the same maggot feeding on many plants. Some fields of grain have been very seriously damaged and a few completely destroyed.

R.A. Cooley,  
June 18, 1918.



NEW MEXICO.

The bean beetle, Epilachna corrupta, has appeared a little earlier than usual in the southern part of New Mexico this year. The adults were noticed at work almost the first of June. A few eggs are to be seen now. Possibilities of damage are thus greater as the beans are comparatively late this year. I have not had any definite reports from the northern part of the State yet concerning this insect.

The pea aphid, Macrosiphum pisi, became very bad in the Mesilla Valley on a few fields of San Luis Valley peas. Those which were planted a trifle late stand a good chance to suffer considerable damage.

The hymenopterous parasites of the cabbage aphid are present now in swarms, nearly every adult aphid being parasitized. Much damage was done to early cabbages in this valley by the aphid, principally on account of lack of preparation for fighting them on the part of growers.

To add to the burden of the drought stricken range, I noticed recently that in several places the mesquite blossoms were destroyed by some of the lepidopterous pest whose identity I do not know. It has the habit of tying the leaves and flower clusters together and eating in this protected place.

Agromyza pusilla is probably more abundant this spring than usual, while Agromyza scutellata is much more abundant. It was found on almost any fleshy leafed garden truck, such as potatoes, beans, cantaloupes, peas, and avas. It was found on but very few cabbages however. From four entire potato leaves 305 larvae and pupa were secured.

Grasshoppers are getting under way in several places and plans are being made to combat them.

D.E. Merrill,  
June 14, 1918.

NEW YORK.

Apple aphids have caused comparatively little complaint. Danger from rosy aphid has passed though recent reports indicate that the green aphid is becoming somewhat abundant upon new growth. There have been practically no apple tent caterpillars throughout the state.

Bud moth (Tmetocera ocellana) injury, in some places serious has been reported from Monroe, Niagara and Wayne Counties in particular.

The cigar case bearer (Coleophora fletcherella) was exceptionally abundant in a few Wayne County orchards.

A cherry fruit fly (Rhagoletis cingulata) appeared in Columbia County in early June, though it has not been reported from other parts of the state.

Curculio, plum (Conotrachelus nenuphar) caused considerable injury to cherries in Oswego County. There was also a report of some damage by the quince curculio (Conotrachelus crataegi) to young pears in Ulster County, the insects coming from nearby quince bushes.

Green fruit worms (probably mostly Xylina antennata) have been somewhat abundant, injury being reported from Columbia, Dutchess, Monroe, Oswego, Rockland



and Wayne Counties.

Leaf roller (Archips argyrospila) has been generally present in the fruit growing sections and quite injurious in certain orchards, especially in Niagara and Oswego Counties.

Pear psylla (Psylla pyricola). There was an abundant deposition of eggs in the western part of the state and in the Hudson Valley, though in most instances thorough spraying has controlled the pest very satisfactorily and in other cases heavy rains have prevented undue multiplication. Complaints have been received in particular from Columbia, Monroe, Niagara, and Wayne Counties.

Red bug (Lygidea mendax) has been increasingly abundant and injurious in the fruit growing sections of the state, especially Niagara, Ontario and Wayne Counties, in a few cases the injury ranging as high as fifty per cent of the crop.

White marked tussock moth caterpillars (Notolophus leucostigma) have been unusually abundant and injurious in the western part of the state, especially in Ontario and Wayne Counties, in exceptional cases fully one-third of the apples in the latter county have been damaged by this insect and many orchards have an infestation sufficiently serious to justify additional spraying.

Injuries by the more common garden insects have been reported as heretofore, cutworms, flea beetles, striped cucumber beetles, and potato beetles being generally present and more or less injurious. The black flea beetle (Epitrix cucumeris) has been exceptionally abundant and destructive to tomato transplants in Dutchess County and its presence in unusual numbers has been reported from other parts of the state.

The wet cool weather has prevented any unusual development of grasshoppers.

Bean fly or seed corn maggot (Phorbia fusciceps). Reports of some injury by this insect were received from Genesee County though conditions are not nearly so serious as was the case last year.

Grass webworms (Crambus vulgivagellus) were found in Broome County in large numbers in old pastures feeding at the roots of grass, infested areas being devastated to a large extent. Some two weeks later it was states that crows, blackbirds, sparrows, and other birds had been so busy feeding on the pest that none could be found and the grass was coming in again. The bronze colored cutworm (Nephelodes violans) and the greasy cutworm (Agrotis ypsilon) were associated with the webworm though in much smaller numbers. This outbreak was apparently very restricted, since nothing of the kind has been reported from other sections of the state.

Lined corn borer (Hadena fractilinea) caterpillars were received from Chenango Bridge, Broome County, accompanied by the statement that more than one half the corn appeared to be infested with the yellowish brown-lined, smooth caterpillars about one inch long. These insects work in the corn much as stalk borers and appear to be comparatively infrequent pests since there is only one other record of injury by this insect in New York, namely at Stone Ridge, Ulster County, in 1913.

Wheat midge (Cecidomyia tritici) is generally present and more or less injurious to rye in Albany, Columbia and Rensselaer Counties. Some fields show from 25 to 33 per cent white heads, these being mostly empty



while a considerable proportion of the others may be infested with maggots, for example, one head with 28 spikelets contained 9 larvae, a second with 22 spikelets contained 35 larvae and a third with 23 spikelets 21 larvae. These heads were all of normal size and from a little distance gave no signs of infestation. There was only a slight yellowish color visible through the glumes. It is probable that a considerable proportion of the grain in fields showing ten per cent or more of white heads is infested in this manner. There may not be a great reduction in the crop due to wheat midge owing to the possibility that the remaining heads and the unaffected grains in the infested heads may increase in size sufficiently to offset in some measure the great reduction in the number of developing grains. Continued cool, wet weather may be accompanied by a considerable midge infestation of wheat as was the case last year.

White grubs. Serious injury is anticipated to corn and potatoes, particularly on recently turned sod in sections of the state where May or June beetles were abundant last year and defoliated or partially defoliated many trees, notably in Albany, Allegany, Broome, Chautauqua, Columbia, Chenango, Delaware, Dutchess, Genesee, Lewis, Oneida, Ontario, Rensselaer, Seneca, Steuben, Suffolk, Ulster, Wyoming, and Yates Counties.

E.P. Felt,

June 18, 1918.

OHIO.

Canker worms were quite abundant in woodlands and in one case we were called to investigate damage reported to be inflicted by gipsy moth; the predators proved to be cankerworms which had destroyed 75 per cent of the foliage over 100 acres of woodland near Cleveland.

In cooperation with the State University we are now conducting a state-wide entomological survey with special reference to wheat insects. We find the wheat midge to be distributed nearly everywhere and more numerous than it has been in Ohio for seven or eight years. We have reports of fields being practically ruined near Coshocton and some along the Ohio River in similar condition. So far as we can judge the state as a whole will not suffer an average damage of more than 1 to 2 per cent, though occasional fields and thin spots in fields may be almost entirely destroyed.

Chinch bugs were present in some numbers in Defiance County. The Extension Entomologist of the University promptly took the chinch bug situation in hand and cooperating with the county agricultural agent has the insect under close observation and is ready to organize whatever effort is necessary to control it.

The lesser clover leaf weevil, *Phytonomus nigrinusstris*, has been rather conspicuous in fields of red clover, especially in Paulding and Van Wert Counties.

The pink potato aphid is abundant in Hamilton County; the county agent promptly organized a repressive campaign and has the situation well in hand.



A number of reports of injury of Papaipema nitela to corn have been received. Cabbage root maggots are reported from many localities. Flea beetle injury to potatoes, tomatoes, egg plants and beans are commonly reported. Wire worms during May were reported seriously damaging and destroying corn seed in several counties.

H.A. Gossard,  
June 26, 1918.

SOUTH DAKOTA.

South Dakota has experienced the following insect outbreaks so far this year. Cutworms are doing an immense amount of damage in practically the whole state, the principal species causing the damage being the greasy cut worm (Agrotis ypsilon). Injury through cut worms is being done not only to corn but also to garden crops. White grub injury as well as wireworm trouble is being reported as very serious in the southeastern corner of the state. The false wire worm (Eleodes sp.?) has been doing considerable damage to wheat in the extreme western part of South Dakota, one farmer writing us that this insect took 200 acres of wheat.

Grasshopper eggs are hatching in immense numbers over almost the entire state. Undoubtedly we shall have considerable trouble with hoppers this year.

The spinose ear tick (Ornithodoros megnini Duges) has been introduced into South Dakota through shipments of cattle and has established itself in Stanley County.

H.C. Severin,  
June 6, 1918.

